IN THE CLAIMS:

1-37. (Cancelled)

38. (Currently Amended) A vibration sensor for monitoring the state of rotating components or bearings, comprising:

a sensor element;

evaluation electronics; and

at least one interface, wherein the evaluation electronics includes an analog-to-digital converter and a signal conditioning means, and

a display means with a display for displaying

wherein the sensor element, the evaluation electronics, and the interface are located in a common housing, and

wherein the signal conditioning means is adapted for receiving a plurality of signals acquired by the sensor element and for converting said signals into a state value using signal analysis and a diagnosis algorithm; [[and]]

wherein said display means is adapted for displaying the state value;

wherein the at least one interface has first and second switching outputs, a parameterization input, and a current and voltage supply input; and

wherein the first switching output is configured for triggering a pre-alarm, and the second switching output is configured for triggering a main alarm.

39. (Previously Presented) The vibration sensor of claim 38, further comprising at least one control element for at least one of parameter input, setting boundary values and choosing an operating mode, and wherein the display comprises a color display, including green, yellow, and red color values.

40. (Previously Presented) The vibration sensor of claim 39, wherein the control element can be locked or blocked mechanically and/or electronically.

41. (Cancelled).

42. (Previously Presented) The vibration sensor of claim 38, wherein the at least one interface includes first and second interfaces, the first and/or the second interface has one signal input for receiving a signal from an external sensor, and the second interface has a current and voltage supply output for outputting to an external sensor, including a proximity switch.

43. (Currently Amended) The vibration [[Vibration]] sensor of claim 38, further comprising at least one memory connected to the evaluation electronics, wherein at least one of parameter values and boundary values are stored in the memory; and wherein the evaluation electronics has a self-learning logic.

44. (Previously Presented) The vibration sensor of claim 38, wherein a state value of a component or of a bearing with a highest degree of damage or poorest state value is at the switching output.

45. (Previously Presented) The vibration sensor of claim 39, wherein the sensor element is located on a circuit board which has at least one rigid segment and at least one flexible segment; and wherein the sensor element is mounted in the common housing near a mounting site of the vibration sensor having low attenuation.

46. (Previously Presented) The vibration sensor of claim 38, wherein the sensor element comprises a biaxial acceleration sensor; and wherein the biaxial

acceleration sensor is located at an angle of 45 degrees to a surface normal on the circuit board, and output signals of two channels of an acceleration signal are added.

47. (Previously Presented) The vibration sensor of claim 39, wherein the common housing is substantially cuboidal and has a beveled top side, and the display means is integrated in the beveled top side; and the common housing is made of metal or plastic and provides at least an IP 65 degree of protection.

48. (Currently Amended) Process for monitoring the state of rotating components or bearings with a vibration sensor which has a sensor element and evaluation electronics, comprising the steps of:

continuously or quasi-continuously acquiring signals with the sensor element;

converting said signals into a state value reflective of the state of the monitored component or bearing using signal analysis and a diagnosis algorithm, the signal analysis taking place both in the time domain and also in the frequency domain, and computing dynamic quantitative averages and/or peak values the time domain;

continuously storing state values; and

computing an expected time interval based on previously determined state values, including a remaining service life, until occurrence of damage that adversely affects serviceability of the rotating component and/or of the bearing.

49. (Previously Presented) The process of claim 48, further comprising performing the signal analysis based on a Fourier transform (FT), a fast Fourier transform (FFT), or an envelope curve fast Fourier transform (HFFT).

50. (Previously Presented) The process of claim 48, further comprising manipulating in the frequency domain values which are supplied to the signal

analysis, including at least one of weighting filtering, windowing and modulating individual signals; and variably setting boundary values of the filtering depending on operating conditions.

51. (Previously Presented) The process of claim 50, wherein the diagnosis algorithm takes place depending on at least one of stored and computed parameterization data and boundary values; wherein the diagnosis algorithm is used to combine individual signals into characteristic values; wherein the characteristic values are compared to the boundary values; and wherein individual signals are weighted according to the relevance of the individual signals.

52. (Previously Presented) The process of claim 51, further comprising the step of combining the individual characteristic values into a state value with consideration of different weighting and with consideration of an operating state.

53. (Previously Presented) The process of claim 48, further comprising the step of subjecting at least one of characteristic values and the state value to plausibility checking so that measurement errors are recognized and do not lead to a faulty state value.

54. (Previously Presented) The process of claim 48, further comprising automatically computing the boundary values in a teach-in mode depending on the parameterization data and the current operating conditions.

55. (Previously Presented) The process of claim 48, further comprising determining a response characteristic between the rotating component or the bearing and the vibration sensor at a start of monitoring of the state.

56. (Previously Presented) The process of claim 55, further comprising:

feeding at least one defined pulse in a three-dimensional vicinity of the rotating component or the bearing into a machine; and

determining the response characteristic from a signal which has been measured by the vibration sensor.

57. (Previously Presented) The process of claim 51, further comprising automatically generating the parameterization data from at least one of a graphic and tabular model description of the machine, components or bearings to be monitored; and inputting the parameterization data via an input unit, including a computer or PC.

58. (Previously Presented) The process of claim 48, further comprising automatically matching the boundary values to a respective rpm.

59. (Previously Presented) The process of claim 58, further comprising:

automatically detecting and measuring the rpm; and

subjecting the automatically detected and measured rpm to plausibility checking so that an error in the determination of the rpm can be detected and corrected.

60. (Previously Presented) The process of claim 54, further comprising:

computing in the teach-in mode the boundary values depending on the parameterization data at an operating rpm; and

automatically computing the boundary values at another rpm using self-learning evaluation logic.

61. (Cancelled).